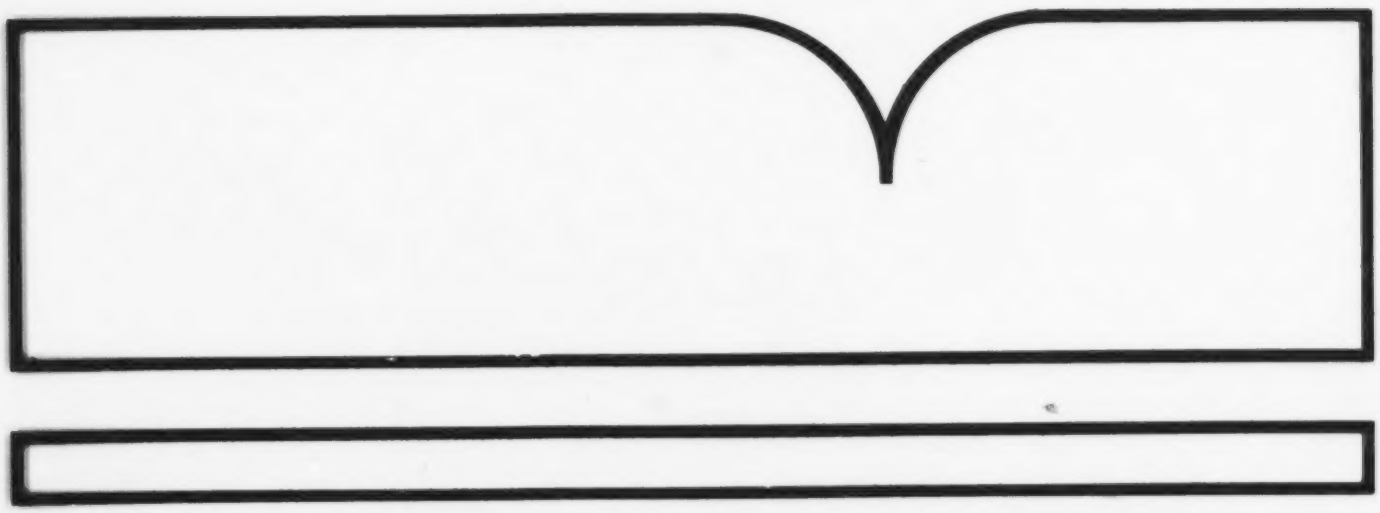
PB83-181149

EPA Evaluation of the Fuel Economizer Device under Section 511 of the Motor Vehicle Information and Cost Savings Act

(U.S.) Environmental Protection Agency
Ann Arbor, MI

Sep 82



U.S. Department of Commerce
National Technical Information Service
NTIS

PB83-181143

EPA-AA-TEB-511-82-15

EPA Evaluation of the Fuel Economizer Device Under Section 511 of the Motor Vehicle Information and Cost Savings Act

by

Stanley L. Syria

September 1982

Test and Evaluation Branch
Emission Control Technology Divison
Office of Mobile Sources
U.S. Environmental Protection Agency

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7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
Stanley L. Syria	
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15. SUPPLEMENTARY NOTES

16. ABSTRACT

This document announces the conclusion of the EPA evaluation of the Fuel Economizer Device under the provisions of Section 511 of the Motor Vehicle Information and Cost Savings Act. The evaluation of the Fuel Economizer device was conducted upon receiving a request from an importer of the device. The Fuel Economizer device is claimed to improve fuel economy and exhaust emission levels, vehicle performance, and also the life of certain ignition components. The Fuel Economizer unit converts the high tension D.C. current given by the ignition coil into high frequemcy A.C. current. This A.C. current of 20,000 cycles per second gives multiple sparks at various points on the spark plug. Being independent of the ohmic resistance it fires the plugs even if they are fouled. This in effect gives cleaner exhaust and fuel economy improvement.

EPA fully considered all of the information submitted by the applicant. The evaluation of the Fuel Economizer device was based on that information and EPA's engineering judgement. Appropriate data was not submitted showing the device could significantly change the ignition characteristics or that it could achieve the benefits claimed. Thus, there is no technical basis for EPA to support the claims made for the device.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Automobiles Fuel Consumption Exhaust Emissions Tests	Fuel Economy Gas Saving Device Ignition Control Device	

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
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EPA Form 2220-1 (9-73)

EPA Evaluation of the Fuel Economizer Device Under Section 511 of the Motor Vehicle Information and Cost Savings Act

The Motor Vehicle Information and Cost Savings Act requires that EPA evaluate fuel economy retrofit devices and publish a summary of each evaluation in the Federal Register.

EPA evaluations are originated upon the application of any manufacturer of a retrofit device, upon the request of the Federal Trade Commission, or upon the motion of the EPA Administrator. These studies are designed to determine whether the retrofit device increases fuel economy and to determine whether the representations made with respect to the device are accurate. The results of such studies are set forth in a series of reports, of which this is one.

The evaluation of the Fuel Economizer device was conducted after receiving an application for the evaluation by an importer of the device. The device is claimed to improve fuel economy and exhaust emission levels, vehicle performance, and also the life of certain ignition components. Because this device is attached into the coil secondary lead and is intended to change the ignition secondary voltage characteristics, it is classified by EPA as an ignition control device.

The following is a summary of the information on the device as supplied by the Applicant and the resulting EPA analysis and conclusions.

1. Title:

   Application for Evaluation of Fuel Economizer Under Section 511 of the Motor Vehicle Information and Cost Savings Act

2. Identification Information:

   a. Marketing Identification of the Product:

      "Choice left to Agamco, Inc."

   b. Inventor and Patent Protection:

      (1) Inventor

         Mr. P.P. Dhahanukar, 508 Gundecha Chambers, Nagindas Master Road, Fort, Bombay-400 023.

      (2) Patent

         "Patent for India only." (Copy of patent not submitted.)

   c. Applicant:

      (1) Name and address

         Agamco, Inc. 2125 Center Avenue, Fort Lee, New Jersey 07024, U.S.A.

(2) Principals

Mr. Martin M. Shapiro

d. Manufacturer of the Product:

(1) Name and address

Mr. P.P. Dhahanukar, 508, Gundecha Chambers, Nagindas Master Road, Fort, Bombay-400 023.

(2) Principals

Mr. P.P. Dhahanukar

3. Description of Product (as supplied by Applicant):

a. Purpose:

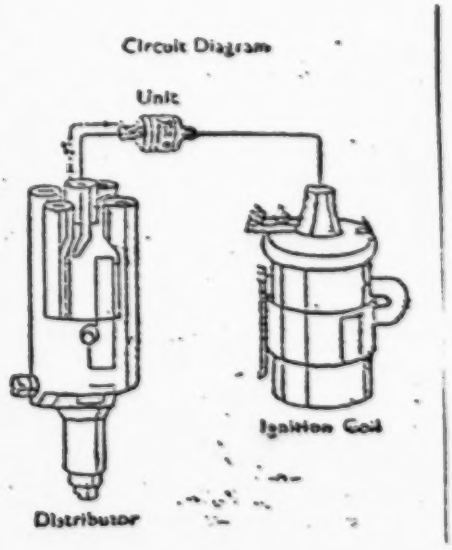
"More complete combustion of the fuel, thereby improving the fuel economy."

b. Theory of Operation:

"The Fuel Economizer unit converts the High Tension D.C. current given by the ignition coil into High Frequency A.C. current. This A.C. current of 20,000 cycles per second gives multiple sparks at various points on the spark plug. Being independent of the ohmic resistance it fires the plugs even if they are fouled. This in effect gives cleaner exhaust and fuel economy as much as 7 to 14% depending on the vehicle, even in the case of electronic ignition system."

c. Construction and Operation:

Circuit Diagram:



d. Specific Claims for the Product:

"*Prevents air pollution
*Reduces fuel consumption from 7 to 14% through complete combustion.
*Increases horsepower.
*Gives easier starting.
*Increases life of plugs and Delco points.
*Gives smoother acceleration, without flat-spot. (Other details to be decided by Agamco.)"

e. Cost And Marketing Information (as supplied by Applicant):

"According to marketing strategy of Agamco, Inc."

4. Product Installation, Operation, Safety and Maintenance (as supplied by Applicant):

a. Applicability:

(1) "All types of petrol engines.

(2) Universal application."

b. Installation - Instructions, Equipment, and Skills Required:

"Installation is very simple. No special tools or skills or adjustments are required."

c. Operation:

"No maintenance procedure required.
Recommended to be replaced after 12 to 15 months."

d. Effects on Vehicle Safety:

"Would not result in any unsafe condition."

e. Maintenance:

"The normal maintenance schedule for the vehicle is in no way affected."

5. Effects on Emissions and Fuel Economy (submitted by Applicant):

a. Unregulated Emissions:

"Not applicable since this device is not for use on diesel vehicles."

b. Regulated Emissions and Fuel Economy:

"Tests as may be required by E.P.A."

6. Testing by EPA:

EPA did not test the device for this evaluation because the test data submitted by the applicant did not adequately support the claims made for the device.

7. Analysis

a. Identification Information:

(1) Marketing Identification:

The marketing identification was not stated. However, elsewhere within the application the device is referred to as the "Fuel Economizer". In supporting test reports (Attachment A) submitted by the applicant, reference is made to "Petrol Saver" and also "Maruti". Although not stated, it is assumed that Petrol Saver, Maruti, and Fuel Economizer are one and the same device. For purposes of this evaluation, the device will be referred to as the Fuel Economizer.

(2) Inventor and Patent Protection:

Although the application states the device is patented only in India, a copy of the patent was not submitted. Because patents often aid EPA in trying to understand how a particular device functions, the applicant was requested (Attachment B) to provide the Agency with a copy. The applicant did not respond to EPA's request.

b. Description:

(1) The primary purpose of the device, as stated by the applicant, is to cause a "more complete combustion of the fuel, thereby improving the fuel economy". The Agency finds no problem with the statement.

(2) The applicant's theory of operation states that, "the Fuel Economizer converts the High Tension D.C. current given by the ignition coil into High Frequency A.C. current. This A.C. current of 20,000 cycles per second gives multiple sparks at various points on the spark plug." It was not stated how the device manages to cause the high frequency current to occur. Also not stated was why multiple sparks should occur at other than the normal gap which is the path of least resistance. Additionally, the impact the device has on secondary resistance, capacitance, rise time, spark duration, and available voltage were not addressed. EPA requested (Attachment B) that the applicant provide more details. Although the applicant responded (Attachment A), the explanations provided were still inadequate. Again EPA requested additional information (Attachment C), however, the applicant did not provide any.

To determine whether the device could alter the secondary voltage characteristics, a sample device provided by the applicant was subjected to some preliminary tests. Specifically, a recent model vehicle was tested, with and without the device, using a Sun Diagnostic Analyzer equipped with an oscilloscope. The oscilloscope patterns showed there were no changes in the primary voltages and that the secondary voltage spark lines were either raised or lowered slightly depending on which side of the device the scope pickup leads were attached. The difference in observed voltages represent a voltage drop across the device and therefore suggests the secondary circuit resistance/impedance was changed as a result of using the device. No other changes were observed in the secondary scope patterns. Also noted was an increase in temperature of the device over that noted during installation. It was attributed to operation of the device and not to elevated engine compartment temperatures.

The Royal Automobile Club (RAC) of England tested the device in a similar manner. Their report (Attachment A) states that, "from the initial tests carried out using an oscilloscope, we are of the opinion that with the use of the device, the high tension spark intensity is increased, naturally improving combustion within the engine, and leading to better performance and thus fuel economy. However, the oscilloscope trace for the secondary circuit is unchanged [emphasis added] whether the device is fitted or not." The RAC report does not define spark intensity nor does it explain how it can state the spark intensity is increased (based on oscilloscope tests) when the oscilloscope trace is unchanged when the device is installed. The main point to be made by referencing the RAC report is that their scope patterns, as well as EPA's, showed the device has minimal impact on secondary voltage characteristics. Admittedly, the oscilloscopes used by RAC and EPA have their limitations and perhaps more sophisticated equipment might be required to show any other changes within the ignition system.

EPA asked the applicant (Attachment B) if the device consisted of capacitors, resistors, diodes, or a transformer, and if so, what were their specifications. The applicant responded (Attachment A) that there were no capacitors, resistors, transformers, or diodes. However, the narrative description in conjunction with the schematic of the device, both of which were submitted in that same letter, suggest the device is indeed a capacitor in series with the other components, i.e., coil and secondary cables, which contribute to the capacitance of the secondary circuit. Because of the open distributor rotor and spark plug gaps, one side of the capacitor is not actually grounded (as it normally is with other capacitors) until the secondary voltage reaches a value high enough to

overcome the combined resistance/impedance of the mica discs within the device and the rotor and spark plug gaps. At that instance, current flow is established, thereby causing a spark to occur across the spark plug gap. Thus, although the device seems to be a capacitor, its use is unlike most others in that it is not truly grounded at all times, and also that the mica discs contained therein are intended to be inadequate in coping with the high voltage and thereby, by leakage, allow current flow to exist. The current flow combined with the high mica resistance/impedance should cause a voltage drop across the device. This energy loss should also result in heat being generated. Both a voltage drop and heat generation were observed during the oscilloscope tests discussed earlier.

Since the device apparently is a capacitor in series with other capacitors, and remembering that capacitors in series result in reduction of the overall capacitance, the device in effect reduces the secondary capacitance. Should this indeed be the case, then the secondary voltage rise time would also decrease with a consequential increase in available voltage and a decrease in spark duration. The rate of energy transfer across the spark plug electrodes would also be expected to increase. While these changes are beneficial with respect to the establishment of a good spark at the spark plugs, it is not known without test data whether the changes would have a significant impact on exhaust emissions or fuel economy. It must be remembered that EPA's understanding of the device is based upon limited information. Should the applicant provide additional information/test data, then EPA may develop a different understanding as to how the device functions and its associated benefits.

(3) The description of the device given in the application was determined by EPA to not be adequate. The construction and operation were not discussed and the schematics of the device in Section 3(c) of the application were not detailed enough. EPA requested (Attachment B) additional details on the device. The applicant's response (Attachment A) included a narrative description and a schematic of the device. While these were considered helpful toward gaining a better understanding of the device, EPA was still not sure how the device functions without additional information from the applicant. The applicant was requested (Attachment C) to submit additional information, but none was provided.

(4) The applicant makes several claims for the device. Based on EPA's understanding of the device, the general claims made with respect to easier starting and increased life of spark plugs and ignition contact points, are considered to be reasonable. The applicant did not specify, nor did he provide data in support of, specific changes that

purchasers of the device may realize. With respect to the other claims made for exhaust emissions, fuel economy, horsepower, and acceleration, the applicant did not provide adequate details about, or test results in support of, the claims made for the device. Thus, without additional information and test results, EPA does not know if the claims are reasonable.

(5) The cost of the device was not stated in the application. EPA requested (Attachment B) the tentative cost of the device, however, the applicant responded (Attachment A) that it could not be commented on as he was unaware of the American production cost. EPA estimates the device would sell for under $20. For most purchasers of the device, this would be the only cost involved as most individuals could easily install it themselves. Even if the purchaser had the device installed at a commercial service facility, the cost of labor would be minimal as only a few minutes would be required.

c. Installation, Operation, Safety and Maintenance:

(1) Applicability:

The applicability of the product as stated in the application is judged to be appropriate (assuming the applicant defines "petrol" engines as being spark-ignition gasoline-fueled engines).

(2) Installation - Instructions, Equipment and Skills Required:

The applicant's statement that, "installation is very simple" and that "no special tools, skills, or adjustments are required" appear to be correct. EPA requested (Attachment B) a copy of the installation instructions which will be provided to purchasers of the device. The applicant provided a copy (Attachment A) which EPA considered adequate. Based on the design of the device, EPA does not expect purchasers to experience difficulty when installing the device.

(3) Operation:

The applicant states, "no maintenance procedure required" and further, "recommended to be replaced after 12 to 15 months". These statements do not actually address operation of the device but rather maintenance. Therefore, they will be commented on later in Section 7c(5) of this report. With respect to operation of the device, EPA judged that the device is capable of functioning without a controlling action from the driver and that it should not affect the operation of the vehicle in any way.

(4) Effects on Vehicle Safety:

Based on the description of the device, EPA judges that the applicant's statement regarding safety is appropriate.

(5) Maintenance:

The applicant states, "the normal maintenance schedule for the vehicle is in no way affected." However, in Section 4c of the application, the applicant states the device should be replaced every 12 to 15 months. EPA asked the applicant (Attachment B) how the optimum replacement interval had been determined. The applicant responded (Attachment A) that, "the device normally works on Indian make of 4 cylinder engines for 3 to 4 years. In American cars having 6 to 8 cylinder engines the safe optimum life would be 12 to 15 months". The applicant did not elaborate as to how this conclusion was reached. Considering that many four cylinder engines are being sold in the U.S., it seems the 3 to 4 year life expectancy should also apply to them.

d. Effects on Emissions and Fuel Economy:

(1) Unregulated Emissions:

Based on the description of the device, EPA does not expect the device to have an adverse affect on unregulated pollutants.

(2) Regulated Emissions and Fuel Economy:

The applicant did not submit test data in accordance with the Federal Test Procedure and the Highway Fuel Economy Test. These two test procedures are the primary ones recognized by EPA for evaluation of fuel economy and emissions for light duty vehicles.* The applicant was notified by telephone and in two letters (Attachments B and C) to submit test results using appropriate procedures. However, the only test results submitted (Attachment A) to EPA were obtained using on-road test procedures. Because the control of variables was inadequate, EPA could not use the data in lieu of that required using the EPA recommended procedures. Thus, the applicant did not submit acceptable data from which EPA could evaluate the effectiveness of the device with respect to the claims made for it.

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*The requirement for test data following these procedures is stated in the policy documents that EPA sends to each potential applicant. EPA requires duplicate test sequences before and after installation of the device on a minimum of two vehicles. A test sequence consists of a cold start FTP plus a HFET or, as a simplified alternative, a hot start LA-4 plus a HFET. Other data which have been collected in accordance with other standardized procedures are acceptable as supplemental data in EPA's preliminary evaluation of a device.

8. Conclusions

EPA fully considered all of the information submitted by the applicant. The evaluation of the Fuel Economizer device was based on that information and EPA's engineering experience. Appropriate data was not submitted showing the device could significantly change the ignition characteristics or that it could achieve the benefits claimed. Thus, there is no technical basis for EPA to support the claims made for the device or to perform confirmatory testing.

FOR FURTHER INFORMATION CONTACT: Merrill W. Korth, Emission Control Technology Division, Office of Mobile Sources, Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105, (313) 668-4299.

List of Attachments

Attachment A	Copy of a letter from Agamco, Inc. to EPA, June 1, 1982.
Attachment B	Copy of a letter from EPA to Agamco, Inc., April 29, 1982.
Attachment C	Copy of a letter from EPA to Agamco, Inc,. June 17, 1982.

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mx

file Fuel 12
Economizer"

AGAMCO, INC.

ATTACHMENT A

2125 Center Avenue
Fort Lee, New Jersey 07024
U.S.A.
TEL: (201) 592-6670
TLX: 135130

June 1, 1982

Mr. Merrill W. Korth
Device Evaluation Coordinator
Emission Control Technology Division
U.S. Environmental Protection Agency
Ann Arbor, Michigan 48105

Dear Mr. Korth,

Further to your letter of April 29th and subsequent phone conversation, we have today received the following responses to the questions you raised in your aforementioned letter as follows:

EPA para 2: For better understanding how the device functions, we would like to give the construction details. It consists of four brass discs on one side separated by mica insulator discs and one brass disc on the other side. These sub assemblies are held appart by metallic spring which also acts as a conductor of electric current. The brass end plates on both sides are directly in contact with the terminals housed in the melamine housing. We are pleased to enclose a sectional drawing showing the construction. There is no capacitor, resistor, transformer or diode. The simplicity of the construction makes the device fail proof and completely reliable.

EPA para 3: The theory of operation for the device is as follows:

(a) In conventional coil ignition system the intermittent high tension DC current is converted into High Frequency AC current

(al) In addition there is a voltage surging effect. Multiple sparks are a result of AC current.

(b) Where the original ignition system has secondary alternating current of 30 megacycles as stated in the EPA letter, the advantage gained may be on account of the surging effect which will raise the voltage. A party in California had mentioned in their letter that it could be also used in electronic ignition system.

EPA para 4: In view of the para 3b above the claims can be substantiated only by actual performance tests on American cars.

EPA para 5: Cannot be commented on, as we are not aware of the American production costs.

EPA para 6: Method of installation is given in our printed leaflet.

AGAMCO, INC.

2125 Center Avenue
Fort Lee, New Jersey 07024
U.S.A.
TEL: 201 592-6670
TLX: 135130

EPA para 7: The device normally works on Indian make of 4 cylinder engines for 3 to 4 years. In American cars having 6 or 8 cylinder engines the safe optimum life would be 12 to 15 months.

We are also enclosing copies of the test reports performed by the Royal Automotive Club in the U. K. and the Automotive Association in West Africa. We trust that the attached will further assist you in your evaluation.

We would be very grateful if you could test the fuel economizer sample which was already forwarded to you, and convey to us your findings.

Thanking you for your kind and continuous attention, we remain,

Sincerely,
AGAMCO, INC.

Martin Shapiro
Director of Sales

MS:hs

The Royal Automobile Club and the Automobile Association Reports on Petrol Saver:

EPA could not obtain legible copies of the subject documents and therefore, they have not been made part of this attachment. Individuals may request copies of these documents from: Merrill W. Korth, Emission Control Technology Division, Office of Mobile Sources, Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, MI 48105. (313) 668-4299.

FUEL ECONOMIZER

How it works :

The Fuel Economizer unit converts the High Tension D. C. current given by the ignition coil into High Frequency A. C. current. This A. C. current of 20,000 cycles per second gives multiple sparks at various points on the Spark Plug. Being independent of the ohmic resistance it fires the plugs even if they are fouled.

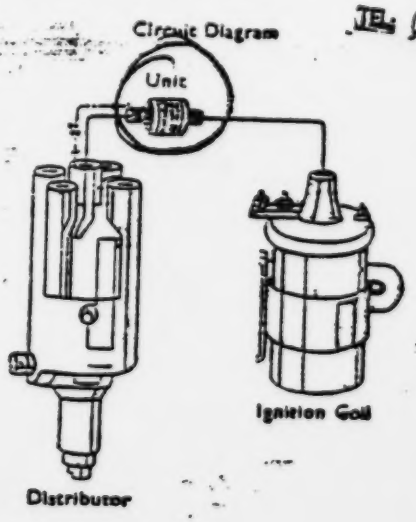
Benefits :

1. Reduces fuel consumption from 10 to 15% through complete combustion.
2. Increases Horse Power.
3. Gives easier starting.
4. Increases life of Plugs and Delco Points.
5. Gives smoother acceleration, without flat-spot.
6. Prevents air pollution
7. Life upto 4 years.

Directions for Installation :

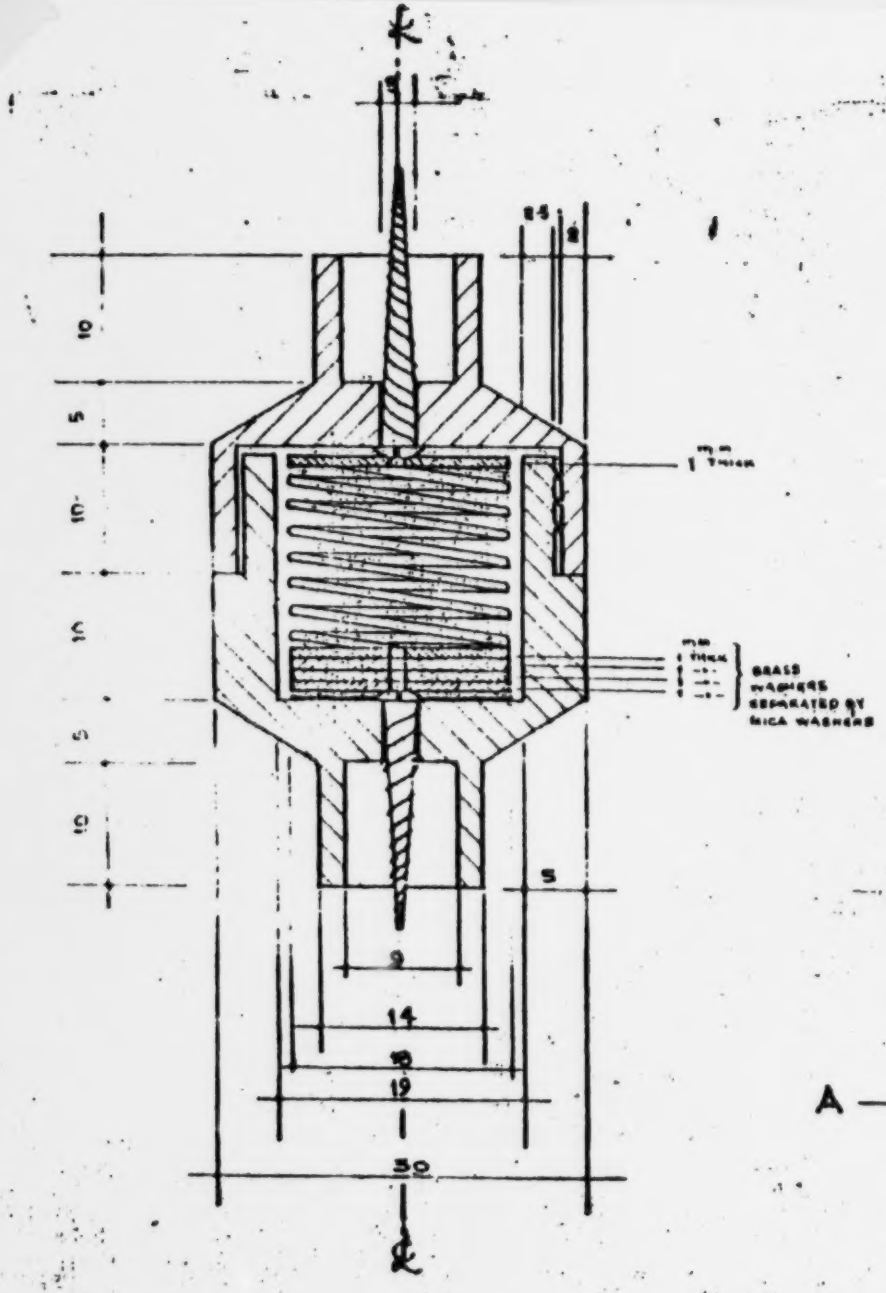
1. Cut with pliers the High Tension Cable between Distributor and Coil, at a distance of 2 inches from the Distributor Cap.
2. Disconnect the cable from the coil.
3. Screw in the unit firmly into the distributor—side cable.
4. Screw in the unit into the cable coming from coil.
5. Connect the cable back to the coil as before.

AGAMCO INC.
2125 CENTER AVENUE
FORT LEE, NEW JERSEY 07024
U.S.A.
TEL: (201) 592-6670 TELX: 135130

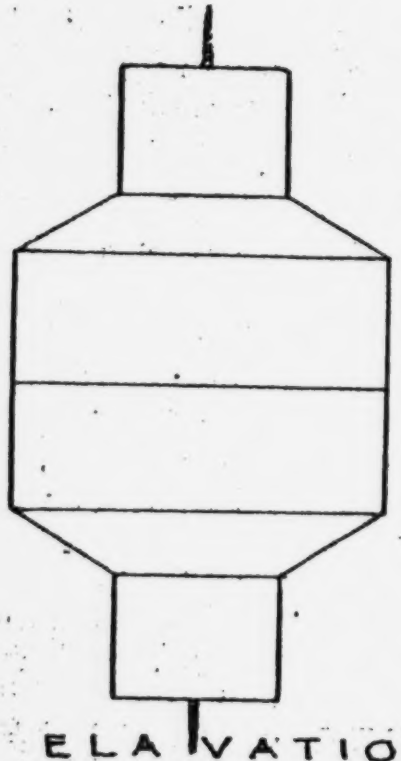


FILE PROMM-2

AGAMCO INC.
2125 CENTER AVENUE
FORT LEE, NEW JERSEY 07024
U.S.A.
TEL. (201) 592-6670 TELX: 135130



SECTION A-A



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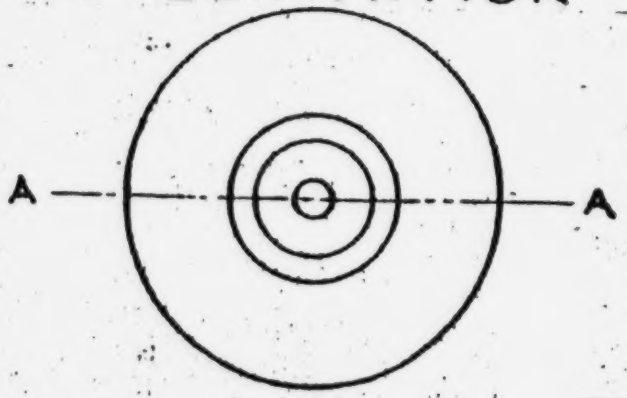

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NOTE:
ALL DIAMENSIONS ARE I

SCALE 1 1/2

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April 29, 1982

Mr. Martin M. Shapiro
Director of Sales
Agamco, Inc.
2125 Center Avenue
Fort Lee, NJ 07024

Dear Mr. Shapiro:

We have received your April 12, 1982 application for an EPA evaluation of the "Fuel Economizer", a fuel economy retrofit device. We have made a preliminary review of your application and will undertake a complete review after all required information has been submitted. Our preliminary comments are as follows:

1. In your transmittal letter which accompanied the application, you stated you would appreciate our testing of the device and providing you with our test results and "approval." I would like to make clear that EPA does not either approve or disapprove devices. We only evaluate the devices and make our findings available to the public in the form of a final report.

2. Section 2(b)(2) states the device is patented in India only. If the patent is in English, you may want to provide us with a copy so that we may develop a better understanding of how the device functions.

3. Section 3(b) of your application describes the theory of operation for the device. Your description does not sufficiently detail how the device manages to convert secondary direct current to alternating current with a frequency of 20,000 cycles per second. Does the device consist of capacitors, resistors, transformers, or diodes? If so, what are their specifications? Considering that all spark ignition engines possess, even without your device, secondary alternating current of approximately 30 megacycles once the spark is established at the spark plugs (often referred to as the capacitance component of the spark discharge), the 20,000 cycles per second frequency attributable to your device would seem to have an insignificant effect when compared to that obtained from the 30 megacycle frequency. Please submit any addditional information you may have showing the affect your device has on secondary resistance, capacitance, rise time, spark duration and available voltage. Also, provide a schematic drawing and a sectioned view of the device.

You also state the high frequency alternating current gives multiple sparks at "various points" on the spark plug. Is our assumption correct that the "various points" you refer to are all located within the combustion chamber? Does your statement mean that current paths are being established at other than the usual gap which is located between the center and ground electrode tips? If so, and considering that electrical current generally follows the path of least resistance (that being the gap located between the center and ground electrode tips for spark plugs), why would current flow be established at longer and more resistive paths when your device is used?

4. In Section 3(d), specific claims are made for the device. On what technical basis are these claims made? Have tests been performed to substantiate the claims? If so, please provide us with the procedures used and the results.

5. Section 3(e) does not include the tentative cost of the device. Please provide the omitted information, if available, so that we can perform a cost analysis for our final report.

6. Section 4(b) states that," installation is very simple". However, no details are given. Are any adjustments of the engine parameters required? Please submit a copy of the installation instructions which will be provided to purchasers of your device.

7. Secion 4(c) states the device should be replaced after 12 to 15 months. How has the optimum replacement interval been determined?

8. Section 5(b) does not include any test results. As explained in my March 8 letter to you, test data will be required from an independent test lab prior to EPA performing any testing. My letter included details on the required test procedures and also stated that a minimum of two vehicles would need to be tested. I suggest you contact independent test labs regarding the testing of your device. I am also ready to assist you in developing an appropriate test plan.

In order to maintain our schedule for evaluating your device, I ask that you respond to this letter by May 21 and that you submit all test data by June 11. Should your have any questions or require further information, please contact me.

Sincerely,

Merrill W. Korth
Device Evaluation Coordinator
Test and Evaluation Branch

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ANN ARBOR MICHIGAN 48103

June 17, 1982

Mr. Martin M. Shapiro
Director of Sales
Agamco, Inc.
2125 Center Avenue
Fort Lee, NJ 07024

Dear Mr. Shapiro:

We have received your letter of June 1 in which you responded to the questions raised in my letter of April 29. Although you provided some of the requested information, you did not satisfy the requirements of the following two areas:

1. Your letter did not sufficiently detail how the device converts secondary direct current to alternating current with a frequency of 20,000 cycles per second. In fact, your response merely reiterated the statement given in the application. Additionally, you did not submit information showing the affect your device may have on secondary resistance, capacitance, rise time, spark duration, or available voltage. Further, you did not explain why sparks should occur at other then the normal center to ground electrode gap.

2. You did not provide the required test data which were explained in my letter of March 8. The road test data that you provided can only be used as supplementary information. A prerequisite to EPA testing is that you provide data which supports the fuel economy claims made for the device. That data must be obtained from an independent facility using the procedures described in my letter of March 8.

So that we may evaluate your device in a timely manner, I ask that all information and data be submitted by July 19. If the required information and data are not received by that date, we will complete our evaluation using all available information. A copy of our final report will be sent to you prior to its announcment in the Federal Register. Should you have questions regarding this course of action, please contact me.

Sincerely,

Merrill W. Korth
Device Evaluation Coordinator
Test and Evaluation Branch